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## (54) RESIN COMPOSITION FOR PIGMENT MASTERBATCH

(57)Abstract:

PURPOSE: To obtain a resin compsn. which enables the production of a pigment masterbatch usable with various coating resins in common.

CONSTITUTION: This resin compsn. comprises a resin for dispersing a pigment and a dispersant consisting of a polyester resin produced by reacting a polycarboxylic acid component and a polyol component contg. at least 50wt.% alkylene oxide adduct of a bisphenol compd.

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**CLAIMS**

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[Claim(s)]

[Claim 1] The resin constituent for pigment masterbatches which \*\* (B) makes polycarboxylic acid (a) and polyol (b) a configuration unit, and is characterized by being polyester resin (B1) whose at least 50 % of the weight in \*\* (b) is the alkylene oxide addition product of bisphenols in the resin constituent for pigment-content powder for coatings which consists of resin for pigment-content powder (A), and a dispersant (B).

[Claim 2] The resin constituent according to claim 1 whose resin for pigment-content powder (A) is resin for pigment-content powder which consists of a copolymer (A1) of the acrylate (d) which has the alkyl group of the acrylate (c) in which a carbon number has the alkyl group of 1-4 (meta), and carbon numbers 6-30 (meta).

[Claim 3] The resin constituent according to claim 1 or 2 whose number average molecular weight of (B) is 1,000-10,000.

[Claim 4] claims 1-3 whose weight ratio (A): (B) is : (70-99.5) (0.5-30) -- either -- the resin constituent of a publication.

[Claim 5] claims 1-4 used by the non-drainage system -- either -- the resin constituent of a publication.

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DETAILED DESCRIPTION

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## [Detailed Description of the Invention]

[0001]

[Industrial Application] This invention relates to the resin constituent for pigment masterbatches. It is related with a suitable resin constituent for pigment dispersibility to manufacture the pigment masterbatch applicable to very extensive paint resin, such as ordinary temperature dry-sand-mould alkyd, an alkyd melamine, acryl lacquer, an acrylic melamine, acrylic urethane, a vinyl acetate-acrylic, and a cellulose nitrate lacquer, for coatings good in more detail.

[0002]

[Description of the Prior Art] Conventionally, the coating containing a pigment etc. is diluted and produced commercially by what mixed a pigment and the resin for distribution and was used for this dispersing element after creating the pigment dispersing element for primary color coatings (pigment masterbatch), and resin of the same kind. When the resin for pigment-content powder which used this for each pigment masterbatch differed from the resin used for dilution mutually, generally the compatibility of resin was bad, it is for the problem of the gloss and degree of hardness of a paint film side falling to arise, and excelled in compatibility with many kinds of paint resin, and development of the resin for pigment-content powder which can be used in common with various plastic paint was desired. For this purpose, the approach (JP,4-91115,A) using urethane denaturation polyester resin as resin for pigment-content powder, the approach (JP,60-139713,A) using the copolymer which consists of butyl acrylate and a specific nitrogen-containing monomer as resin for pigment-content powder, etc. are proposed.

[0003]

[Problem(s) to be Solved by the Invention] However, since the class of resin in which compatibility is shown was limited, the copolymer which there is a trouble that weatherability is inadequate since it has the urethane bond although urethane denaturation polyester resin has the resin and the compatibility of the comparatively large range in the above-mentioned approach, and weatherability cannot use it for a required coating (coating for sheathing etc.), and consists of butyl acrylate and a specific nitrogen-containing monomer had the trouble that it cannot be used for the coating of the large range.

[0004]

[Means for Solving the Problem] When it dissolved in very extensive paint resin and fitness and mixed to each resin, this invention persons did not spoil the original engine performance of each plastic paint including weatherability, but as a result of examining wholeheartedly the resin for pigment masterbatches which is excellent also in pigment dispersibility, they reached this invention.

[0005] That is, this invention is a resin constituent for pigment masterbatches which \*\* (B) makes polycarboxylic acid (a) and polyol (b) a configuration unit, and is characterized by being polyester resin (B1) whose at least 50% of the weight of \*\* (b) is the alkylene oxide addition product of bisphenols in the resin constituent for pigment-content powder for coatings which consists of resin for pigment-content powder (A), and a dispersant (B).

[0006] In this invention, divalent carboxylic acids (a1), the carboxylic acids more than trivalent (a2), and such mixture are mentioned as polycarboxylic acid (a) which constitutes a dispersant (B1), for example.

[0007] As an example of divalent carboxylic acids (a1) for example, aliphatic series dicarboxylic acid (a maleic acid, boletic acid, and a succinic acid --) An adipic acid, sebacic acid, a malonic acid, an azelaic

acid, mesaconic acid, a citraconic acid, alicyclic dicarboxylic acid (cyclohexane dicarboxylic acid --), such as glutaric acid aromatic series dicarboxylic acid (a phthalic acid and isophthalic acid --), such as a methyl MEJIKU acid A terephthalic acid, toluene dicarboxylic acid, naphthalene dicarboxylic acid, etc., The low-grade alkyl ester (methyl, butyl, etc.) of the anhydride of these divalent carboxylic acid or these divalent carboxylic acid is mentioned to an alkenyl succinic acid [an iso dodecenyl succinic acid, an n-dodecenyl succinic acid, a PENTA decenyl succinic acid], etc. and a list.

[0008] As an example of the polycarboxylic acid more than trivalent (a2) for example, aliphatic series polycarboxylic acid [-- 1, 2, and 4-butane tricarboxylic acid -- 1, 2, 5-hexane tricarboxylic acid, 1, a 3-dicarboxyl-2-methyl-2-methylene carboxy propane, ], such as tetrapod (methylene carboxyl) methane, 1, 2 and 7, and 8-octane tetracarboxylic acid, Alicyclic polycarboxylic acid (1, 2, 4-cyclohexane tricarboxylic acid, etc.), aromatic polycarboxylic acids (1,2,4-benzenetricarboxylic acid, 1 and 2, and 5-benzene tricarboxylic acid --) These anhydrides and these low-grade alkyl ester (methyl, butyl, etc.) are mentioned to lists, such as 2, 5, 7-naphthalene tricarboxylic acid, 1 and 2, 4-naphthalene tricarboxylic acid, pyromellitic acid, and benzophenone tetracarboxylic acid.

[0009] In these (a), aromatic series dicarboxylic acid, an alkenyl succinic acid, aromatic polycarboxylic acids and these anhydrides, and these methyl ester are desirable.

[0010] As polyol (b), diol (b1), the polyols more than trivalent (b2), and such mixture are mentioned.

[0011] as the example of diol (b1) -- alkylene glycol (ethylene glycol --) Propylene glycol, butanediol, neopentyl glycol, alkylene ether glycols (a diethylene glycol --), such as butene diol, pentanediol, and hexandiol Triethylene glycol, dipropylene glycol, a polyethylene glycol, alicyclic diols (cyclohexane dimethanol --), such as a polypropylene glycol and a polytetramethylene glycol Hydrogenation bisphenol A etc. can mention the 2-8 mol addition product of alkylene oxide (ethylene oxide, propylene oxide, etc.) of bisphenols and bisphenols (bisphenol A, Bisphenol F, bisphenol S, etc.).

[0012] As an example of the polyol more than trivalent (b2), these alkylene oxide addition products can be mentioned to aliphatic series polyhydric alcohol (a sorbitol, hexane tetra-ol, sorbitan, pentaerythritol, dipentaerythritol, tripentaerythritol, butane triol, pentanetriol, glycerol, methyl propane triol, 2-methyl-butane triol, trimethylolethane, trimethylol propane, etc.) and aromatic series polyhydric-alcohol lists (trihydro KISHIRU methylbenzene etc.).

[0013] In these (b), the alkylene oxide addition product of bisphenols, alkylene glycol, and aliphatic series polyhydric alcohol are desirable, and especially the alkylene oxide addition product of bisphenols is desirable.

[0014] (b) The operating rate of the alkylene oxide addition product of inner bisphenols is usually 70 - 100 % of the weight preferably 50 to 100% of the weight to the whole quantity of (b).

[0015] (a) And monocarboxylic acid, monoalcohol, etc. can use it if needed for the purpose of adjustment of molecular weight, or control of a reaction in addition to (b). As the example, monocarboxylic acid (a benzoic acid, parahydroxybenzoic acid, a toluene carboxylic acid, a salicylic acid, an acetic acid, a propionic acid, stearic acid, etc.), monoalcohol (benzyl alcohol, a toluene-4-methanol, cyclohexane methanol, etc.), and two or more sorts of such mixture are mentioned, for example.

[0016] the ratio of (a) which constitutes (B1), and (b) -- as a hydroxyl equivalent / carboxyl group equivalent ratio -- usually -- 0.6-3.0 -- it is 0.8-2.0 preferably.

[0017] the number average molecular weight by the gel permeation chromatography (GPC) of (B1) -- usually -- 1,000-10,000 -- it is 2,000-5,000 preferably. The paint film physical properties of a coating fall that it is less than 1,000, and if 10,000 is exceeded, compatibility may fall.

[0018] As a process of (B1), there is especially no limit, (b) is blended with the usual (a) at a predetermined rate, and the method of performing a polyesterification reaction is mentioned.

[0019] 150-300 degrees C of reactions are usually preferably performed under 170-280-degree C temperature conditions under existence of a catalyst. Moreover, although a reaction can be performed under ordinary pressure, reduced pressure, or pressurization, after reaching predetermined conversion (for example, 30 - 90%), it is desirable to react by decompressing preferably 200 or less mmHgs of systems of reaction to 25 or less mmHgs.

[0020] As the above-mentioned catalyst, the catalyst (tin, titanium, antimony, manganese, nickel, zinc, lead, iron, magnesium, calcium, germanium, etc.) usually used for polyesterification, for example, metals, and these metal content compounds (dibutyltin oxide, orthochromatic dibutyl titanate,

tetrabutyl titanate, zinc acetate, lead acetate, cobaltous acetate, sodium acetate, antimony trioxide, etc.) are mentioned.

[0021] As resin for pigment-content powder in this invention (A) Although there will be especially no limit if it has the compatibility over various paint resin and paint film physical properties are not reduced For example, the resin for pigment-content powder with which a carbon number consists of a copolymer (A1) of the polymerization nature monomer (e) which has the alkyl (meta) acrylate (c) which has the alkyl group of 1-4, the acrylate (d) which has the alkyl group of carbon numbers 6-30 (meta), and a functional group is mentioned.

[0022] In this case, as (c), methyl (meta) acrylate, ethyl (meta) acrylate, 1-propyl (meta) acrylate, isopropyl (meta) acrylate, n-butyl (meta) acrylate, isobutyl (meta) acrylate, t-butyl (meta) acrylate, and two or more sorts of such mixture are mentioned, for example.

[0023] In order not to reduce the degree of hardness of a coating among these (c), that to which a glass transition point becomes high, i.e., methyl (meta) acrylate, ethyl methacrylate, isobutyl methacrylate, and t-butyl (meta) acrylate are desirable, and a methylmetaacrylate and especially t-butyl methacrylate are desirable.

[0024] As (d), for example Hexyl (meta) acrylate, cyclohexyl (meta) acrylate, Octyl (meta) acrylate, 2-ethylhexyl (meta) acrylate, Nonyl (meta) acrylate, DESHIRU (meta) acrylate, dodecyl (meta) acrylate, Tridecyl (meta) acrylate, tetradecyl (meta) acrylate, 1-methyl tridecyl (meta) acrylate, hexadecyl (meta) acrylate, Octadecyl (meta) acrylate, ray KOSHIRU (meta) acrylate, DOKOSHIRU (meta) acrylate, tetra-KOSHIRU (meta) acrylate, thoria KONCHIRU (meta) acrylate, and two or more sorts of such mixture are mentioned.

[0025] When it dissolves in various paint resin and fitness among these (d) and mixes to each resin, in order not to spoil the original engine performance of each resin including weatherability, hexyl (meta) acrylate, cyclohexyl (meta) acrylate, octyl (meta) acrylate, 2-ethylhexyl (meta) acrylate, nonyl (meta) acrylate, DESHIRU (meta) acrylate, and dodecyl (meta) acrylate are desirable.

[0026] As a polymerization nature monomer (e) which has a functional group, a hydroxyl-group content monomer (e1), a carboxylic-acid content monomer (e2), and a nitrogen-containing monomer (e3) are mentioned. As an example of (e1), hydroxyethyl (meta) acrylate, hydroxypropyl (meta) acrylate, hydroxy butyl (meta) acrylate, 2, 3-dihydroxy propyl (meta) acrylate, 3-chloro-2-hydroxy (meta) acrylate, etc. are mentioned. Among these especially a desirable thing is hydroxyethyl (meta) acrylate.

[0027] As an example of (e2), an acrylic acid (meta), a maleic acid (anhydrous), a fumaric acid, an itaconic acid, etc. are mentioned, and a desirable thing is an acrylic acid (meta).

[0028] As an example of (e3), 3rd class amino-group content (meta) acrylate [dimethylaminoethyl (meta) acrylate, Diethylaminoethyl (meta) acrylate, dimethylaminopropyl (meta) acrylate, ]; cyano alkyl (meta) acrylate [cyano ethyl (meta) acrylate] etc., such as diethylaminoethyl (meta) acrylate; Acrylonitrile, Acrylamide [(meta) acrylamide, methyl (meta) acrylamide, (Meta) Cyclohexyl (meta) acrylamide, dimethyl (meta) acrylamide, ], such as dimethylaminopropyl (meta) acrylamide; Amine imide radical content (meta) acrylate [trimethylamine (meta) acrylic imide, Dimethyl ethylamine (meta) acrylic imide, dimethyl hydroxy propylamine (meta) acrylic imide, ], such as dimethylphenyl hydroxyethyl (meta) acrylic imide; 4th class ammonium content (meta) acrylate [(meta) acryloyloxyethyl trimethylammonium chloride, (Meta)], such as an acryloyloxyethyl trimethylammonium methosulfate, is mentioned. Things desirable [ among these ] are acrylamides (meta) and amine imide radical content (meta) acrylate, and especially a desirable thing is acrylamide (meta).

[0029] the weight ratio of (c): (d) in a copolymer (A1) -- usually (30-95) -- : (5-70) -- it is : (45-90) (10-55) preferably. If the ratio of (c) becomes insufficient [ less than 30 / the compatibility over acrylic resin, especially the acrylic resin containing vinyl acetate ] and exceeds 95, compatibility with an alkyd resin will get extremely bad.

[0030] moreover, (c+d): (e) -- a weight ratio -- usually (40-98) -- : (2-60) -- it is : (60-95) (5-40) preferably. If the ratio of (e) becomes insufficient [ less than two / pigment dispersibility ] and exceeds 60, the compatibility of an alkyd resin will get extremely bad.

[0031] as (e) -- usually (e1) -- from -- to be at least one sort chosen from the group of (e3), and what is necessary is just the range of the above-mentioned weight ratio However, in order to discover higher dispersibility to various pigments, the thing containing all of (e1) to (e3) is more desirable as (e). For a

hydroxyl value [ further / (A1) ], the acid number is [ a hydroxyl value ] 5 - 100 mgKOH/g preferably 0.005 to 50 mgKOH/g in 3 - 120 mgKOH/g, and especially the thing whose acid number is 0.01 - 40 mgKOH/g is desirable.

[0032] A copolymer (A1) may carry out copolymerization of the other polymerization nature monomers (f) as occasion demands in addition to the above (c), (d), and (e).

[0033] As (f), if as copolymerizable as (c), (d), and (e), there will be especially no limit. As an example (c), (d), and acrylate (meta) [pentyl (meta) acrylate other than (e), Benzyl (meta) acrylate, dibromopropyl (meta) acrylate, Isobornyl (meta) acrylate, tetrahydrofurfuryl (meta) acrylate, Allyl compound methacrylate, JISHIKURO pentenyl (meta) acrylate, Dicyclopentanil(metha)acrylate, glycidyl (meta) acrylate, Acryloxy ethyl phosphate, caprolactone denaturation-2-hydroxyethyl (meta) acrylate, (Meta) 2-perfluoro octyl ethyl (meta) acrylate, gamma-(meta) acryloxy pro PIRUTORI (trimethylsiloxy) silane, ]; vinyl aromatic compound, such as acrylic sulfoethyl (styrene, vinyltoluene, alpha methyl styrene, etc.); (Meta) A vinyl chloride, vinyl acetate, a butadiene, a dicyclopentadiene, vinyl pyrrolidone, an isoprene, etc. are mentioned.

[0034] The amount of [ in the case used of using (f) ] is usually 20 or less % of the weight preferably 30 or less % of the weight among [ all / in a copolymer (A1) ] a monomer.

[0035] the number average molecular weight by GPC of (A1) -- usually -- 1,000-10,000 -- it is 1,500-8,000 preferably. Less than by 1,000, if the paint film physical properties of a coating are reduced and 10,000 is exceeded, compatibility with various paint resin will fall.

[0036] Although not limited especially as the manufacture approach of (A1), the monomer mixture which consists of (f) according to (c), (d), (e), and the need can be manufactured massive or by carrying out solution polymerization by radical polymerization methods, such as well-known thermal polymerization, photopolymerization, or radiation polymerization, for example. A desirable polymerization method is a radical solution polymerization method which used the radical initiator in the organic solvent.

[0037] In the case of solution polymerization, as an organic solvent used, these two or more sorts of mixture, such as alcohols, such as ether, such as ketones, such as ester, such as aliphatic hydrocarbon, such as aromatic hydrocarbon, such as toluene and a xylene, a heptane, and a mineral spirit, ethyl acetate, and butyl acetate, a methyl ethyl ketone, and methyl isobutyl ketone, butyl cellosolve, butyl carbitol, and ethylene glycol wood ether, isopropanol, n-butanol, and t-butanol, is mentioned. A solvent desirable [ among these ] is independent or such mixture of toluene, a xylene, methyl isobutyl ketone, and butyl acetate.

[0038] When performing a radical polymerization reaction, as a radical initiator to be used, peroxides, such as azo system initiators, such as azobisisobutyronitril and azobisiso valeronitrile, t-butyl peroxybenzoate, t-buthylperoxy isobuthylate, di-t-butyl peroxide, and a hydrogen peroxide, etc. are mentioned. Things desirable [ among these ] are azobisisobutyronitril, t-butyl peroxybenzoate, and t-buthylperoxy isobuthylate.

[0039] In the manufacture approach of (A1), a well-known chain transfer agent, for example, lauryl mercaptan, dibenzyl ether, etc. may be used as occasion demands.

[0040] The polymerization temperature in manufacture of (A1) may usually be 50-180 degrees C, and which approach of a batch or a continuation polymerization is sufficient as the approach of a polymerization.

[0041] Although the resin constituent for pigment masterbatches of this invention which consists of resin for pigment-content powder (A) and a dispersant (B) is obtained also by the approach of mixing (A) and (B) after manufacture separately, it can also obtain (B) by manufacturing (A) under existence of (B) after manufacture.

[0042] As for the resin constituent for pigment masterbatches of this invention, an organic solvent, other paint resin, or the various additives for coatings (a surfactant, a fluid regulator, a pigment agent, adhesion improver, etc.) may be blended with the resin for pigment-content powder (A), and a dispersant (B) by the need.

[0043] A pigment masterbatch is obtained by blending an organic solvent, other paint resin, or the various additives for coatings according to the resin constituent for pigment masterbatches, pigment, and need for this invention. Although the pigment concentration in this case changes with classes of pigment, it is usually 10 - 60 % of the weight.

[0044] As an organic solvent, what was illustrated as said solvent for polymerizations can be used.

[0045] As a pigment, inorganic pigments (carbon black, ferrous oxide, titanium oxide, a calcium carbonate, the chrome yellow, a zinc white, Berlin blue, etc.), organic pigments (a nitroso pigment, a nitro pigment, an azo pigment, phthalocyanine pigment, etc.), and such mixture are mentioned, for example.

[0046] The compound of the resin constituent for pigment-content powder of this invention or the pigment masterbatch for coatings using it is obtained by carrying out mixed distribution by the usual approach using the usual disperser, for example, a roll mill disperser, a SANDOGURAINDOMIRU disperser, a planetary mixer, a high speed DISUPA disperser, etc.

[0047]

[Example] Hereafter, although an example explains this invention further, this invention is not limited to this. The section in an example is the weight section.

[0048] [Manufacture of a dispersant]

Put in the neopentyl glycol 200 section, the propylene oxide (PO) addition product (hydroxyl value 275) 800 section of bisphenol A, the trimellitic anhydride 406 section, and the Djibouti rutin oxide 3.5 section into the reaction vessel equipped with example of manufacture 1 agitator, a capacitor, a thermometer, and inert gas installation tubing, it was made to react at 230 degrees C under a nitrogen air current for 3 hours, temperature was lowered to 200 degrees C, and the polyesterification reaction was further advanced under reduced pressure. Number average molecular weight is 3,000 (based on GPC.). the following -- being the same -- the time of becoming -- a reaction -- stopping -- a xylene -- diluting -- 50% of nonvolatile matters -- the dispersant solution 1 was obtained.

[0049] The neopentyl glycol 100 section, the PO addition product (hydroxyl value 315) 464 section of bisphenol A, the ethylene oxide (EO) addition product (hydroxyl value 340) 434 section of bisphenol A, the isophthalic acid 467 section, and the tetrabutyl titanate 4 section were made to react like the example 1 of example of manufacture 2 manufacture. When number average molecular weight was set to 2,500, the reaction was suspended, and the dispersant solution 2 which dilutes with a xylene and becomes 50% of nonvolatile matters was obtained.

[0050] The trimethylol propane 300 section, the PO addition product (hydroxyl value 315) 200 section of bisphenol A, the EO addition product (hydroxyl value 340) 200 section of bisphenol A, the terephthalic-acid 340 section, the dodecenyl succinic-anhydride 275 section, and the Djibouti rutin oxide 3.5 section were made to react like the example 1 of example of manufacture 3 manufacture. When number average molecular weight was set to 3,500, the reaction was suspended, and the dispersant solution 3 which dilutes with a xylene and becomes 50% of nonvolatile matters was obtained.

[0051] [Manufacture of the resin for pigment-content powder]

In the reaction vessel equipped with example of manufacture 4 agitator, a capacitor, a thermometer, inert gas installation tubing, and a dropping pump Put in the methyl-isobutyl-ketone 30 section and the xylene 70 section, and inert gas is introduced. Under [ after flowing back methyl isobutyl ketone (temperature; 114-118 degrees C) ] stirring, The methylmetaacrylate 62.5 section, the octyl methacrylate 15 section, The maleic-anhydride 0.5 section, the hydroxyethyl acrylate 3 section, the trimethylamine (meta) acrylic imide 5 section, The mixture of the styrene 10 section, the cyclohexyl methacrylate 5 section, and the t-BUCHIRUPA-OKIISO butyrate 5 section is dropped over 3 hours, and the after [ dropping termination ] t-buthylperoxy isobuthylate 2.5 section is added over 1.5 hours. It was made to react at this temperature for further 1 hour, and the resin solution 1 for pigment-content powder which becomes number-average-molecular-weight 5,600 was obtained 50% of nonvolatile matters.

[0052] The dispersant solution 1 obtained in the example 1 of [preparation of pigment masterbatch] manufacture and the resin solution 1 for pigment agents obtained in the example 4 of manufacture were mixed so that a weight ratio might become 5/95, and the resin constituent 1 for pigment masterbatches was obtained. Similarly, the dispersant solution 3 and the resin solution 1 for pigment agents to the resin constituent 3 for pigment masterbatches was obtained for the resin constituent 2 for pigment masterbatches from the dispersant solution 2 and the resin solution 1 for pigment agents, respectively. Moreover, it remained as it is and the resin solution 1 for pigment agents was used as the resin constituent 4 for pigment masterbatches for a comparison.

[0053] to the each 20 section of the obtained resin constituents 1-4 for pigment masterbatches, by the SANDOGURAINDOMIRU disperser, the titanium oxide 60 section, the xylene 10 section, and the



propylene-glycol-monomethyl-ether mono-acetate 10 section were mixed, and it distributed until grain size was set to 10 micrometers or less, and pigment masterbatch [1] - [4] was prepared.

[0054] performance test pigment masterbatch [1] - [4], and a melamine / alkyd varnish {melamine resin varnish [-- the mixed varnish () of the solid content weight ratios 2/8 of MERAN [ by Hitachi Chemical Co., Ltd. ] #28], and 30% soybean-oil denaturation trimethylol propane phthalic-acid varnish of oil lengths [ nonvolatile matter ] 50%}, and a melamine / acrylic varnish {melamine resin varnish [-- MERAN [ by Hitachi Chemical Co., Ltd. ] #28], and acrylic resin A (methyl methacrylate -- the 60 section) The copolymer by the monomer presentation of the butyl acrylate 28 section, the hydroxyethyl acrylate 10 section, and the acrylic-acid 2 section, Mixed varnish (nonvolatile matter 50%)} of the solid content weight ratios 2/8 of number-average-molecular-weight 15,000 was mixed so that a resin solid content weight ratio might become 5/5, and the white coating B1 from a melamine / acrylic varnish - B4 were obtained for the white coating A1 - A4 from the melamine / alkyd varnish. Spray painting was carried out so that desiccation thickness might set each white coating after dilution and might be set to 30 micrometers in this coating by mixed thinner at a processing steel plate, and printing Ushiro's paint film engine performance was evaluated for 140-degree-C 20 minutes. The result is shown in Table 1.

[0055]

[Table 1]

-----									
	実 施 例								比較例
	1		2		3		4		
-----+-----+-----+-----									
顔料マーカー <sup>*</sup>	[1]		[2]		[3]		[4]		
-----+-----+-----+-----									
白塗料番号	A1	B1	A2	B2	A3	B3	A4	B4	
-----+-----+-----+-----									
鏡面光沢度 1)	89	93	88	95	90	93	81	90	
鉛筆硬度 2)	HB	H	HB	H	HB	H	B	F	
-----									

[0056] 1) JIS K-5400 67 ; 60 degree mirror reflectivity 2 JIS K-5400 614; it is use [0057] about a Mitsubishi uni-pencil.

[Effect of the Invention] Since it excels in pigment dispersibility very much and the resin constituent for pigment masterbatches of this invention shows various paint resin and good compatibility to various pigments, the manufacture of the pigment masterbatch which can be used common to various paint resin of it is attained. The pigment masterbatch using the constituent of this invention can be used as a coloring agent of very extensive coatings, such as an ordinary temperature dry-sand-mould alkyd coating, an alkyd melamine coating, an acryl lacquer coating, an acrylic melamine coating, a vinyl acetate system coating, and a charge of nitrocellulose lacquering, consequently decreases the class of pigment masterbatch sharply, and raises the productivity of a coating.

[Translation done.]